



Major Storm To Impact The Region

December 15, 2021
7:00 AM

Key Messages

Severe Storms Possible 3 - 7pm

Damaging High Winds Wednesday Evening/Overnight

Snow, and Flash Freeze Possible After Dark

Additional Details

- A broken line of thunderstorms may bring severe weather to areas along and east of I-29 Wednesday afternoon.
- Late Wednesday afternoon and evening light snow will likely combine with strong winds west of I-29. Accumulations are possible!
- A rapid drop in temperatures may also cause flash freezing.
- West winds Wednesday evening/night may gust up to 50 to 70 mph.

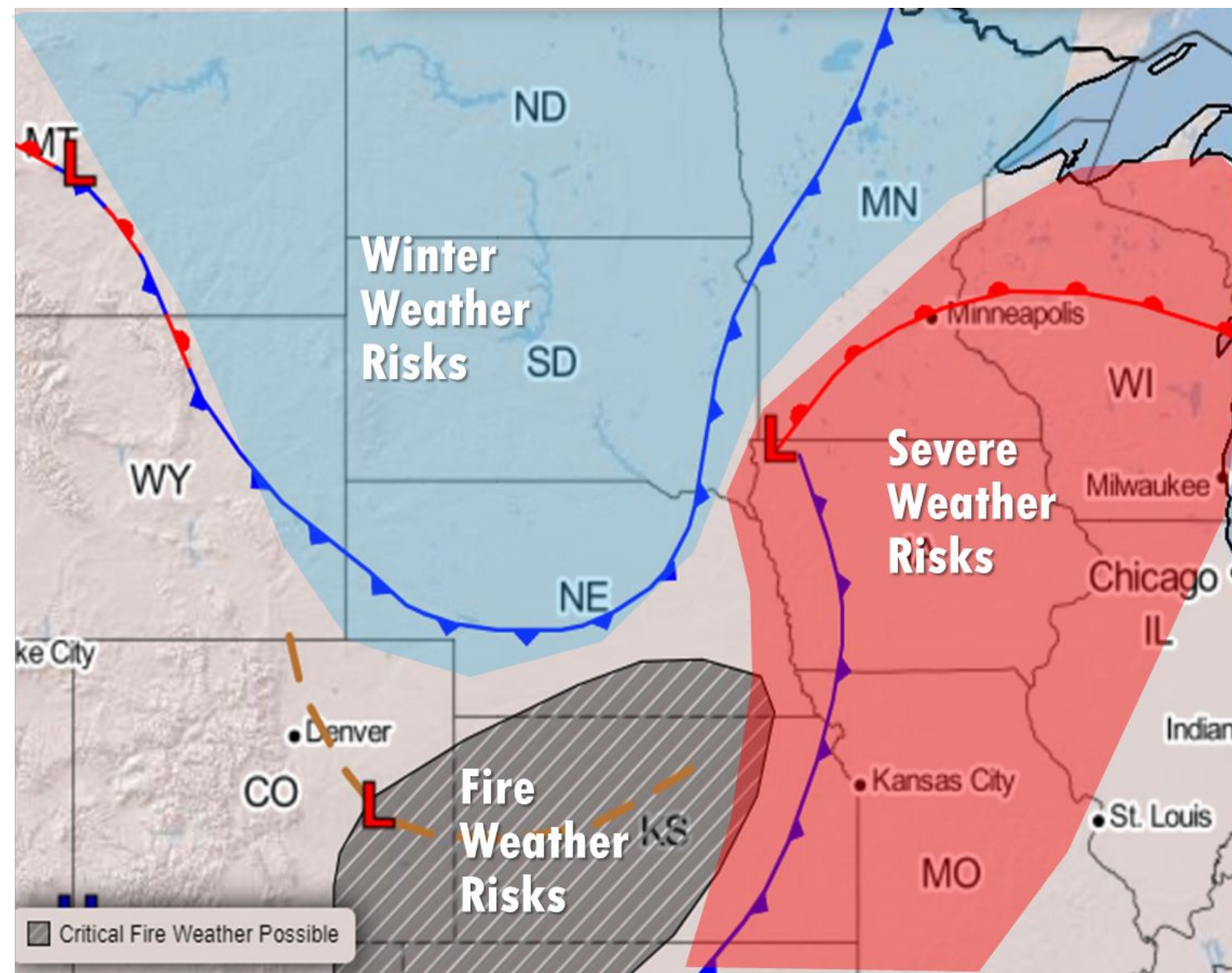
NEW

Important Updates

- Severe weather risks have increased for areas of NW Iowa into Minnesota. Snow trended up west of the James River.

Next Scheduled Briefing Packet

- 5pm Wednesday Afternoon



Wednesday's Weather Map and Risks



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Sioux Falls, South Dakota



Wednesday's Severe Storm Risks

December 15, 2021
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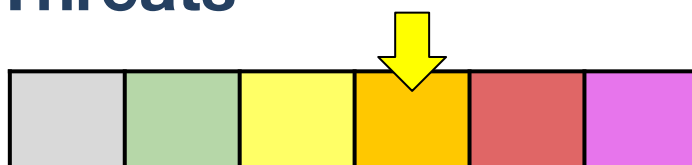
A Line of Storms May Bring Strong Winds and a Tornado Risk

Key Points:

- Storms form across northeast Nebraska and quickly race off to the east/northeast
- Damaging straight line winds and tornadoes possible. High end wind damage is possible.
- Once line of storms pass, thunderstorm risk will diminish quickly.

Potential Threats

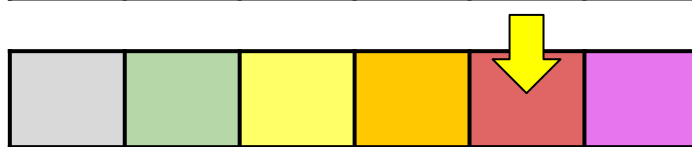
 Tornado



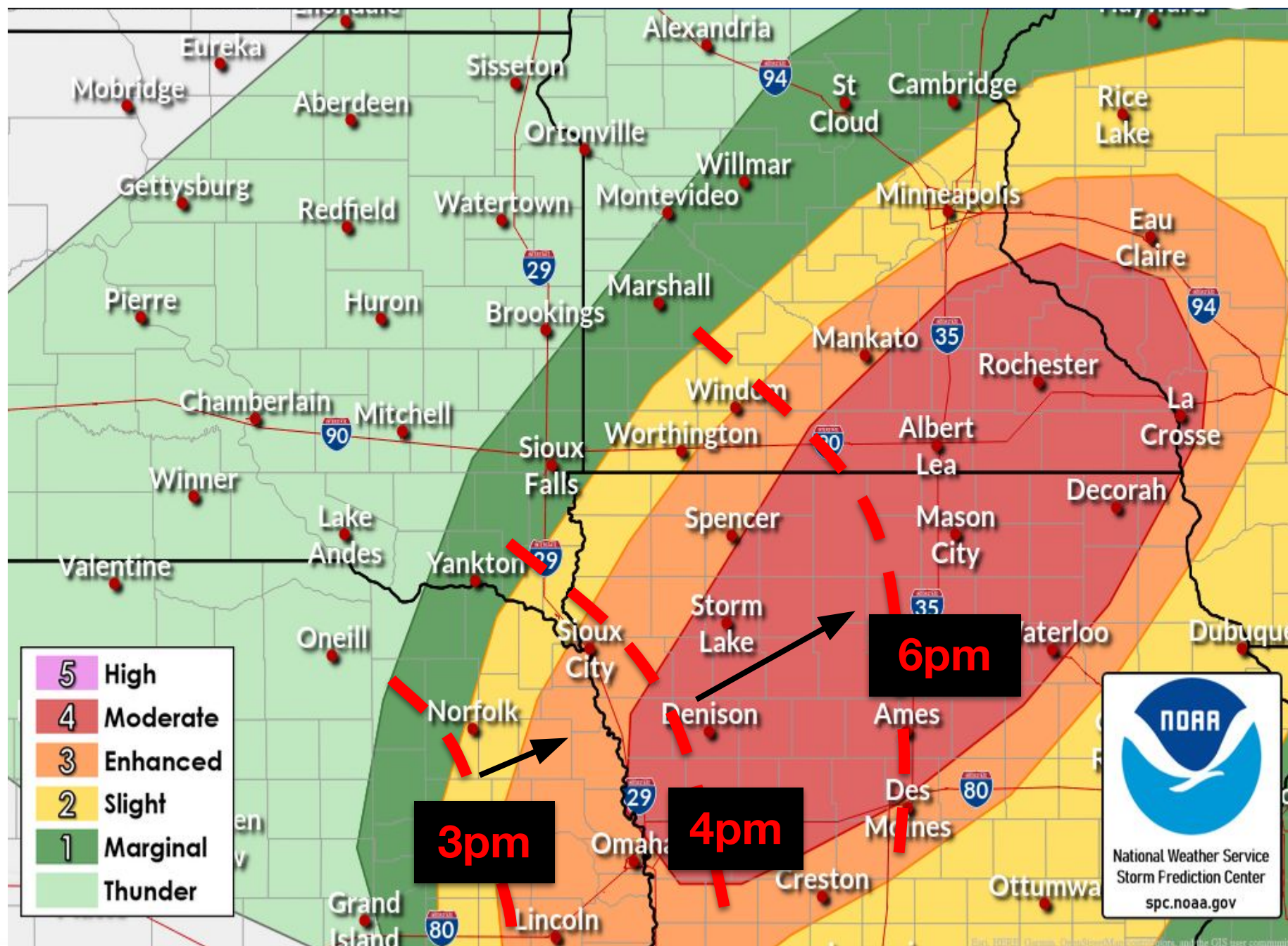
 Hail



 Wind



 Flooding



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Probabilities of Each Severe Weather Element

Large Hail



Potential Impacts: Damage to vehicles, homes, property.

Damaging Winds



Potential Impacts: Tree damage likely, power line damage possible, minor shingle damage possible, outdoor furniture and loose objects blown around.

Tornado



Potential Impacts: Property damage or destruction.



National Weather Service Sioux Falls, South Dakota

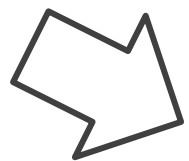


Strong Winds Expected Wednesday

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Strongest Winds Late Wednesday Afternoon into the Evening

Wind Direction



South/southwest early, turning west through the evening.

Peak Gusts

 **45 to 65+ mph**

Potential Impacts



- Tree and structure damage possible
- Power Outages (some extended) are possible.
- Dangerous travel for high profile vehicles
- Difficult travel for all vehicles

Confidence in Winds



Low

Medium

High

	12/15 Wed															12/16 Thu										
	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	12am	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am
Brookings	14	21	26	31	33	33	33	33	33	35	40	46	51	52	49	45	44	43	41	38	35	31	30	29	29	28
Chamberlain	7	13	17	23	26	31	37	43	48	51	48	51	47	47	43	37	33	31	28	26	23	20	17	16	15	17
Huron	16	21	24	28	30	32	30	33	38	44	45	47	47	47	44	40	38	36	33	32	29	25	23	22	20	21
Lake Andes	18	20	22	24	30	36	41	49	60	66	63	59	52	47	43	39	33	29	25	25	25	25	24	23	21	21
Madison	17	22	26	30	33	36	36	35	35	35	41	48	54	54	51	46	45	44	41	39	36	32	31	30	29	29
Marshall	10	16	21	24	24	22	21	21	22	25	31	41	48	55	59	56	55	53	49	47	43	39	37	36	33	32
Mitchell	18	21	23	25	26	29	32	38	45	51	52	53	52	49	45	40	38	36	33	31	29	28	25	24	22	22
Pipestone	17	23	28	30	31	32	32	32	35	37	44	51	56	58	55	51	49	48	46	43	39	35	32	31	31	29
Sioux Center	24	28	31	33	35	35	37	39	43	47	55	54	55	55	52	48	46	43	39	36	32	29	26	24	23	23
Sioux City	24	28	31	35	38	41	45	48	52	54	61	54	53	51	47	46	43	38	35	32	29	25	22	20	17	20
Sioux Falls	18	22	25	28	30	31	32	33	36	39	45	49	53	53	49	46	45	43	40	38	36	33	31	28	25	25
Spencer	25	28	30	32	33	35	37	40	44	48	49	56	59	60	59	55	51	46	43	40	38	35	32	30	28	28
Storm Lake	29	30	31	33	37	39	43	47	52	56	58	62	63	63	61	54	48	43	39	37	36	35	31	28	24	24
Watertown	14	15	25	30	29	30	29	26	26	33	37	40	47	52	51	47	44	40	38	37	37	32	30	29	29	29
Windom	23	26	29	31	30	29	30	33	39	45	48	52	54	59	59	58	56	54	51	47	43	38	35	33	32	30
Worthington	22	25	28	30	31	31	32	35	39	44	48	54	58	60	59	54	53	49	47	44	40	37	35	33	31	29
Yankton	20	22	25	28	28	30	37	46	55	61	63	59	55	52	48	47	43	38	35	32	31	30	26	24	21	22

Wednesday Wind Gusts (mph)



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Snow and Cold Also on Wednesday

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Snow, Blowing Snow, and Flash Freeze All Possible



Key Point:

Flash freeze of any wet roadways expected areawide as temperatures quickly drop Wednesday evening

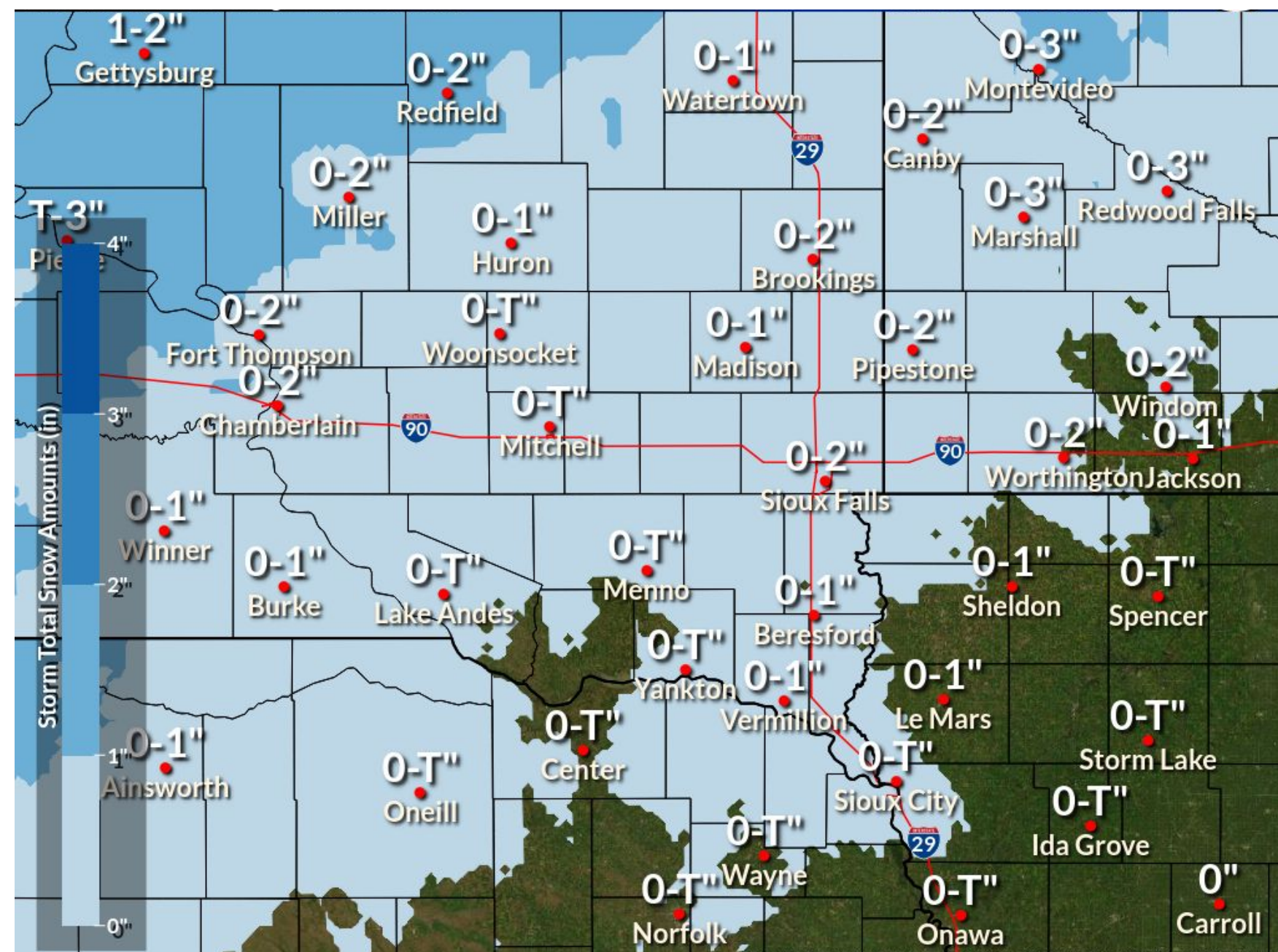
Additional Details

- Period of light to moderate snow expected as colder air arrives, mostly west of I-29.
- Accumulations look to remain light, **but some uncertainty on where snow bands may develop. Which leads to higher snow ranges.**
- When combined with strong winds, reduced visibility is likely and travel may be impacted



Timing

Beginning	Late Wednesday Afternoon
Peak	Wednesday Evening
Ending	Around Midnight



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Potential Storm Impacts and Timing

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Thunderstorm Risks Increase after 3pm, High Winds Arrive After Dark

Roads & Transportation

- Rapid changeover to snow may lead to poor travel conditions west of Interstate 29 Wednesday evening. Flash freeze may be possible into the night further east.
- High winds will lead to dangerous travel for high profile vehicles

Power and Infrastructure

Strong winds late Wednesday afternoon may lead to damage to homes, buildings, and power infrastructure.

Power outages may be possible into Wednesday night. In some areas, extended power outages may be possible.

Airline Delays

Regional airports may have delays to due strong winds and precipitation. Stay in contact with your airlines for more information.

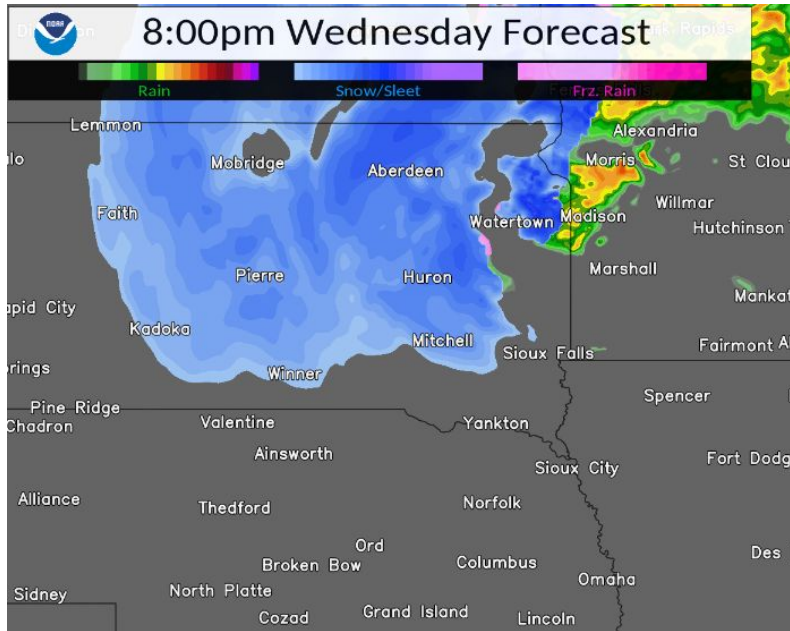
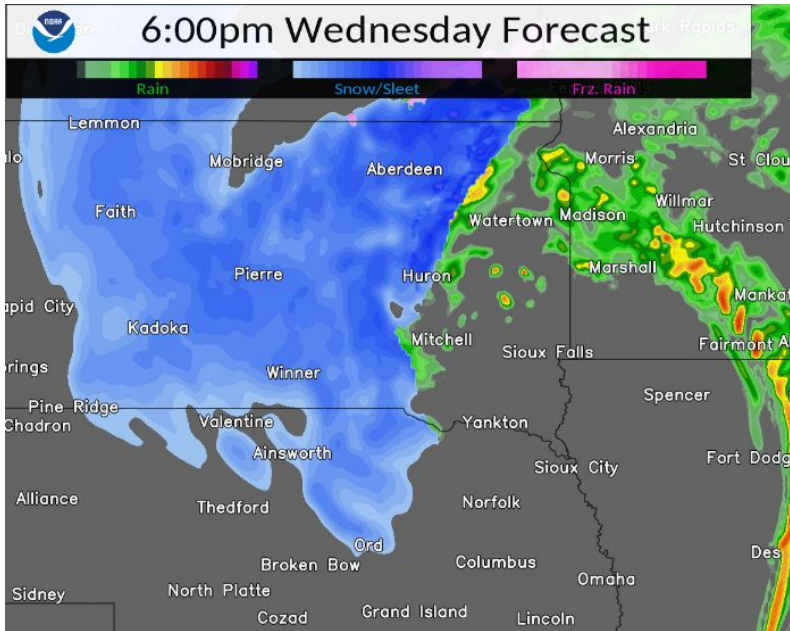
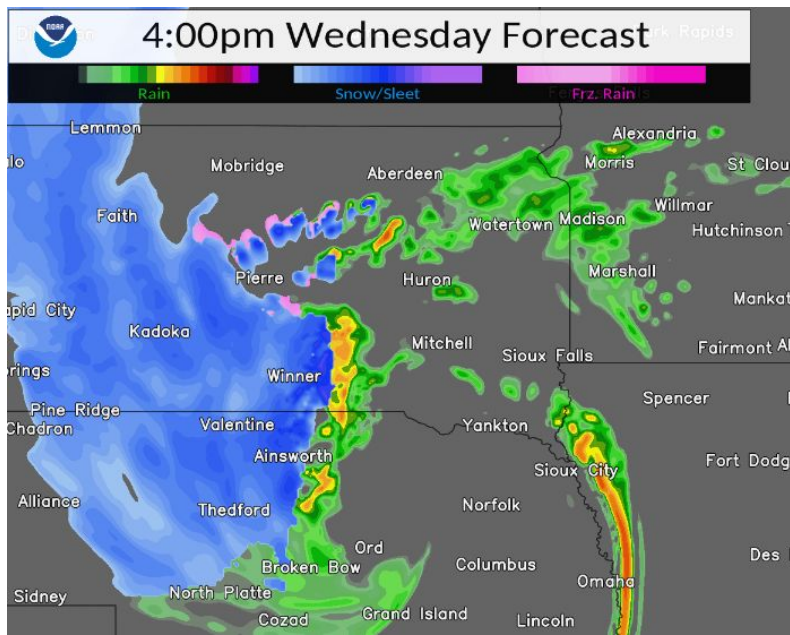
None

Low

Moderate

High

Storm Timing





Temperature Timeline and Confidence

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Temperature Trends Through the Night

Maximum Temperature Forecast

	12/15 Wed												12/16 Thu												
	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	12am	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	12pm
Brookings	44	45	46	47	47	46	45	42	37	31	28	25	24	22	21	21	20	19	19	18	18	19	21	23	23
Chamberlain	43	45	44	42	39	35	29	27	25	24	23	24	24	24	23	22	21	22	22	21	21	22	26	28	30
Huron	42	43	44	45	43	39	36	31	29	26	24	23	23	22	22	22	21	20	21	20	19	21	23	25	27
Lake Andes	46	50	51	52	48	42	33	29	27	24	24	24	23	23	23	22	22	22	21	21	21	22	27	30	31
Madison	43	45	45	46	46	45	43	40	34	28	26	23	23	21	21	21	20	19	20	19	19	21	22	24	26
Marshall	49	51	52	52	53	52	53	50	46	43	36	33	31	28	27	25	24	23	22	21	20	21	22	24	25
Mitchell	41	43	44	44	43	41	37	33	29	26	25	23	23	22	22	21	21	21	20	20	20	21	23	26	29
Pipestone	46	47	49	50	51	49	49	45	41	36	31	28	26	24	22	22	22	21	20	19	19	20	22	24	24
Sioux Center	50	53	55	56	57	54	50	44	40	33	30	28	26	24	24	23	24	24	23	22	23	24	25	28	29
Sioux City	57	60	62	62	61	57	52	46	39	34	31	29	27	26	26	25	25	25	24	24	23	25	29	31	33
Sioux Falls	43	46	47	47	50	48	46	43	37	31	28	26	25	24	23	22	21	21	21	20	20	21	24	26	27
Spencer	56	58	60	61	61	59	55	50	47	41	36	33	30	28	26	25	25	24	24	23	23	25	27	29	30
Storm Lake	63	65	65	65	65	62	57	52	47	40	35	33	29	27	27	26	26	25	24	23	23	24	27	29	31
Watertown	41	44	46	46	44	41	38	34	31	28	25	23	22	20	19	18	17	16	15	15	15	16	18	19	21
Windom	49	51	53	54	56	54	54	50	47	44	39	34	31	28	27	26	25	24	23	23	22	23	24	26	27
Worthington	48	49	51	52	54	53	51	46	44	40	34	30	28	25	24	23	24	23	22	21	21	22	24	26	27
Yankton	50	53	55	56	55	52	46	38	33	30	29	27	26	26	25	25	25	25	24	23	23	25	28	31	33

Potential for Flash Freezing

Timing of Precipitation



Winter Weather Types



Potential for Impacts



Confidence Details

- Strong confidence for high wind potential
- Growing confidence in impactful winter weather and flash freeze potential, though snow amounts and locations are less certain.





Historical Perspective of the Event

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Rarity of Potential Severe Weather Event

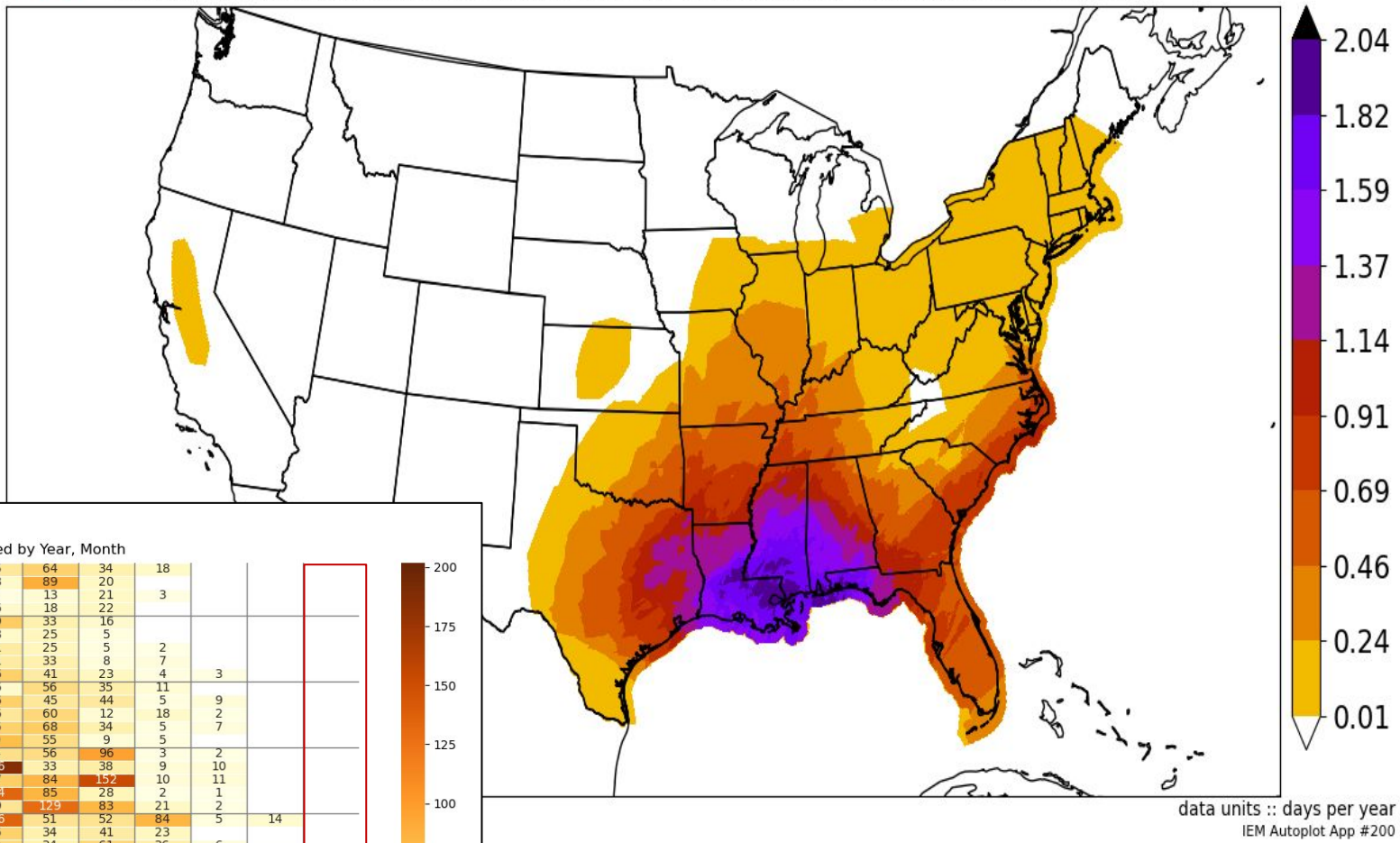
This storm will bring a rare December severe weather risk to portions of the Northern Plains and Great Lakes areas.

Historically, there have been no “slight” or greater risk categories issued for the Tri-State area in December since records began in 2002.

The Sioux Falls National Weather Service Forecast office, dating back to 1986, has never issued a severe thunderstorm warning or tornado warning in December in our area of responsibility.



SPC Day 1 Convective @13z Outlook [Dec] of at least Categorical Slight Risk
Average Number of Days per Year, Found 118 events for CONUS between 03 Dec 2002 and 11 Dec 2021



NWS Sioux Falls Severe Thunderstorm Warning (SV.W) Issued by Year, Month												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986				10	30	45	64	34	18			
1987			2		15	18	89	20				
1988					3	13	21	3				
1989				6	23	16	18	22				
1990					20	69	33	16				
1991			3	2	42	18	25	5				
1992					17	41	25	5	2			
1993					1	41	33	8	7			
1994				9	1	66	41	23	4	3		
1995					2	16	56	35	11			
1996			1		25	66	45	44	5	9		
1997					4	46	60	12	18	2		
1998			7	11	47	65	68	34	5	7		
1999				4	40	79	55	9	5			
2000												
2001			3		9	46	54	56	96	3	2	
2002					58	16	186	33	38	9	10	
2003					29	41	67	84	152	10	11	
2004					5	5	184	85	28	2	1	
2005				6	56	202	49	120	83	21	2	
2006				1	19	75	136	51	52	84	5	14
2007				8	8	21	65	34	41	23		
2008				11	23	57	59	34	61	36	6	
2009						52	125	62	41	14		2
2010			1	20	1	14	56	97	40	2		
2011					19	25	98	74	47	51	4	
2012				7	41	56	39	56	66	4	1	
2013				2		125	32	11	24	26		1
2014				2		18	51	10	29	7		
2015					2	14	14	22	14			
2016					13	19	48	39	40	14		2
2017					5	28	54	53	30	12		
2018				3	5	14	101	66	53	22	6	
2019					12	22	55	23	45	8		
2020					1	3	25	70	46	26	1	
2021					3		88	57	38	3	13	
					10	2	24	27	94	9	4	

Generated at 15 Dec 2021 12:31 AM CST in 2.04s



Safety and Resources

December 15, 2021
7:00 AM



Message to Distribute



A multitude of weather hazards are expected Wednesday and Wednesday night. Severe weather east of I-29, blowing snow west of I-29, wind gusts of 50-70 mph across the entire region.



Additional Resources

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Forecast

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